Farm and Garden.

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Bulletin No. 13.

This Bulletin of the Vermont Station, dated November, 1888, was not received until after the New Year. It reports an experiment in cutting and planting potatoes by C. W. Minot, horticulturist of the Station, and a series of fertilizer analyses. Of the potato experiment, it will perhaps be enough to to say that it was not begun until June 23—with potatoes which had sprouted in the cellar to the length of three to five inches. The vines were slightly frosted September 5, and killed September 30. The variety used was the Pecan, and the object was to try fourteen different methods of cutting and planting. Fourteen rows fifty feet long and three feet apart were planted, with seed from large whole tubers, down to single-eyes halved. There were some differences as regards the seed in other respects, and also in cultivation. Of the fourteen rows, six did not all come up, and in one row not half came up. It is needless to add that the results were quite inconclusive, and the experiment, for all practical purposes, a failure. One may well ask, "Why print it?"

This Bulletin also contains thirty-six fertilizer analyses, covering the principal makes and brands sold in the state. Professor Cooke states that the average quality of the fertilizers sold in 1888 was so much better, and the average price so much less than in 1885, that there was a net gain per ton to the farmer of $6.24, or twenty-one per cent. Noting this fact, the report says: "There can be little doubt that the work of the Station in making the tests and circulating the results broadcast over the state has been a powerful factor in this favorable result." This is true to some extent, as it was essential that we should have such analyses made to prevent Vermont from being flooded with poor fertilizers, made especially for sale within her borders. But as this increase in value and reduction of price is general throughout New England, our Station can hardly claim more than a concurrent influence in that direction. The truth is that the agricultural press, by disseminating a knowledge of the composition and value of fertilizers, and of the chemical and agricultural facts related to their use, has made our reading farmers more vigilant, and much better judges of the practical value of such manures. The proof of this is seen in the fact that few manufacturers think it worth while to send low-grade goods into this state; and the bulk of the trade is in the hands of the four or five concerns which make the best goods. Nevertheless, it remains true that there is still a gap, on the average, to the disadvantage of the farmer, of $5.73 per ton between the retail price of the materials of these fertilizers and the retail price of the fertilizers themselves. This margin is claimed to be necessary to cover the costs incurred between the makers and the consumers, made up mainly of advertising, freight, commissions and interest—the latter, in great part, being on the credit granted to farmers. The worst thing about this system is that so few farmers pay cash that all have to pay the credit price, as all the business has to be done through local agents. Were the farmers ready to-day, as a class, to buy their fertilizers for net cash, taking the goods from the cars in January, February and March, while the roads are good and the time convenient to get them home, they could buy their fertilizers on the average four dollars per ton cheaper than they now get them. In order to do this, they would have to buy by the carload and pay the money when the goods are delivered. Professor Cooke estimates the gain resulting to the farmers from the supervision of the Station at $6.24 per ton—that is, the quality of the goods has improved and the price diminished, since 1885, to that extent. But this saving could be increased at least four dollars per ton simply by making it a cash business—that is, our "shrewd Vermont farmers" (!!!) pay over ten per cent for about four months' credit on their purchased manure, or at the rate of nearly thirty-three per cent per annum. This is one of the wholly unnecessary tributes that labor is paying to capital right here in enlightened New England.

Now for these analyses. The tables are worth studying. They are well compiled, and lack only the extension (for which the page affords plenty of room) of the total Station price of the available constituents of each fertilizer. As they are now given, the reader has to copy off and add up the Station prices of the nitrogen, phosphoric acid and potash of each brand before he can get at the main fact he wants to know.

One thing strikes the student of these analyses very sharply, and that is the close agreement in the valuation of all the brands sold at about the same price, even when the composition is quite different. We have heard nothing of a fertilizer trust, but this looks as though the makers have a pretty good understanding among themselves in regard to this matter. Let us take a look at it from this point of view:

MEDIUM GRADE.	
Bowker's Hill and Drill, Station valuation	$20 13
Bradley's XL	20 07
Bradley's Potato	20 24
Cleveland	20 58
Cleveland's Potato	20 02
E. Frank Coe	20 58
Soluble Pacific Guano	20 24
Pine Island	20 25
Buffalo Potato	20 79
Americus	20 81
Bowker Potato	20 43
Bay State	20 54
Buffalo	20 54
Williams & Clark Potato	20 61
Bradley's Sea Fowl	20 25
Quinnipiac Potato	20 87

The above list of sixteen well-known brands have here an extreme variation in valuation of only $2.44 per ton—a difference not much, if any, greater than may be found in samples taken from the same barrel. This is the class of goods commonly sold at $38 per ton at retail. Other brands range higher, as follows:

Bowker's Stockbridge, Station valuation	$23 65
Cumberland	22 17
Bradley's Complete	41 50
Quinnipiac	24 45
LOWER GRADES.	
Lister's Success, Station valuation	$25 67
Orient	23 79
Standard	27 17
Standard Guano	22 17
King Philip	22 91
Uniform	26 84
Buffalo Special	25 34
Bowker's Sure Crop	26 01
Cumberland Seeding Down	27 88

It is worth while for us to notice the variation in composition of those medium-grade fertilizers which are sold at about the same price—for some of these may be more suitable to one crop, or one soil, than to another:

	Nitrogen.	*P. Acid.*	*Potash.*
Bowker's Hill and Drill	$10 18	$17 63	$1 32
Bradley's XL	10 29	17 46	1 32
Bradley's Potato	9 87	14 53	5 53
Cleveland	10 08	17 59	1 91
Cleveland Potato	10 29	16 24	3 09
E. Frank Coe	9 14	16 46	3 28
Soluble Pacific Guano	9 80	16 72	2 72
Pine Island	10 02	17 81	1 32
Buffalo Potato	9 82	18 20	2 77
Americus	9 25	17 84	2 70
Bowker Potato	10 46	15 08	2 92
Bay State	9 43	18 44	2 85
Buffalo	11 22	15 77	1 54
Williams & Clark Potato	11 16	13 15	6 30
Bradley's Sea Fowl	10 45	17 77	2 05
Quinnipiac Potato	13 37	12 09	5 50

It is easy to see that though they are so close together in price these fertilizers are by no means all alike. They have the same constituents, but these vary greatly relatively to one another. The most noticeable difference is the great increase in potash in the potato fertilizers. It is only since the German potash salts began to be imported that potash has formed an important, or more than an accidental, element in commercial fertilizers. The potash in these potato fertilizers goes in at the expense of the nitrogen, or the phosphoric acid, or of both. Bradley shrinks both nitrogen and phosphoric acid to get in $5.53 worth of potash. Bowker shrinks the phosphoric acid only, but gets in only 2.92 of potash. The Buffalo shrinks both nitrogen and phosphoric acid to get in $3.77 of potash. The Quinnipiac makes a large shrinkage on phosphoric acid, increases its nitrogen and shows about the same potash as Bradley—$5.50. Williams & Clark shrink almost as much on phosphoric acid, and exceed all the other potato specials in potash, showing a valuation of $6.30 in that article.

As to this matter of potash for the potato crop, especially on those light soils otherwise well-suited to potatoes, but nearly destitute of available potash, we have, for ourself, preferred not to buy the special potato fertilizers in which nitrogen or phosphoric acid, or both, have been scanted in order to get in more potash, for the reason that so long as good unleached hard-wood ashes can be had for fifty cents a barrel we think we can do better to use that. On some of the heavier soils of the state, where ashes do not seem to be needed, it would also be well not to use those special potato fertilizers, to the exclusion of those that are richer in constituents other than potash.

But how about other crops? Well, for small grains the average grades on this list are probably best for heavy and medium soils, taking those strongest in nitrogen by preference. On lighter soils, for small grains, we should take the same if we could buy ashes; otherwise we would want more potash from some other source. As salt is usually a help to these small grains, perhaps potash might be best furnished to them by the application of say 500 pounds of kainit to the acre, this being mostly salt, with about twelve per cent of potash in it, or about twice as much as good ashes contains. When it comes to corn, we have a crop that on a corn soil wants potash liberally and phosphoric acid even more liberally, but does not seem to need a great quantity of nitrogen. There are a good many experiments which seem to have shown that the corn crop will not pay for much nitrogen. If this is so, then of course the right fertilizer for corn might not be one of the more costly brands, but one like Lister's Success, which would be a success on corn probably sooner than on any other crop, as it has, of nitrogen, only the value of $5.22, while it has $18.96 of phosphoric acid and $1.49 of potash. The Cumberland Superphosphate has $19.58 of phosphoric acid; Bradley's Sea Fowl, $17.77; Bradley's XL., $17.46; Cleveland's, $17.59; Bowker's Hill and Drill, $17.63; Bay State, $18.44; Buffalo, $17.77; Bowker's Sure Crop, $17.74. Of these, the two lower-grade brands, Lister's Success and Bowker's Sure Crop, are probably as good for corn as the higher-priced brands.

But now, before we stop, we want every reader who intends to use these commercial fertilizers, as well as all those who will depend wholly upon a home supply of manure, to remember that while all are valuable—yes, essential in their place—yet manure alone will not make a crop. "TILLAGE IS MANURE," and if we must slight one of the two, we should sadly but resolutely put tillage first. One-quarter of our fertilizing material in this state (at least one-quarter) is lost at the barn. More than another quarter is stolen by weeds, and pretty near another quarter that is in the soil the plants can not get for lack of a good preparation—good plowing, harrowing, etc. Do we mean to say, then, that we farmers in Vermont do not get out of our land more than one-fourth as much as we might if we were all we ought to be, and might be, as tillers of the soil? We do mean just that. Thorough farming of all the farms in the state of Vermont would easily quadruple the money value of her farm products. For most of us it is certainly better to try to do this, rather than to emigrate.

[SEE FIFTH COLUMN.]

A Young Man Asks Advice.

A young Vermonter, who says he has been a diligent student of this department, and of the *Rural New-Yorker* and other farm papers, and has also had the benefit of working under the direction of one of the most successful farmers of his vicinity, writes to us, saying that he is thinking of a possible term or two at some agricultural school, and to ask what course of reading he had better take in the next few months, as a little preparation for such a course of study. He also desires a few hints, how to start an agricultural library. He has had, he says, only a common school education, but his letter indicates that he has improved such opportunities as he has enjoyed pretty well.

It is a pity that every young man like this could not have a full course in some good agricultural college; and the time is coming when every state will have such an institution, with free scholarships enough, so that no student seeking its advantages will be turned away. But meantime, in Vermont, we fear this particular youth will have become as gray as the writer. For his immediate reading, we suggest the purchase of Professor Storer's recent work, entitled "Agriculture," in two volumes, costing, we think, $4.00, which any book-seller will order for him. For his brief course of study, he could not do better than to enter Professor Cooke's class in agricultural chemistry at Burlington. Unquestionably, the greatest and most general lack, in the way of profitable knowledge among farmers, is the lack of any acquaintance with this science, upon which, more than any one thing else, an intelligent agriculture must be based.

Starting his library with Storer's Agriculture, and with the chemical text-books required at Burlington, we think President Garfield's plan of enlarging his stores of special knowledge to be at once the cheapest, the best and the most educative of any. This is the formation of scrap-books, one for each subject, made up of cuttings from the newspapers. Our young friend, if limited in funds, can easily get almost any agricultural paper to wants, and all he wants, either by getting them subscribers, or by furnishing them with practical short notes on all sorts of interesting farm topics, the style of which he can soon get into by studying like things in the papers themselves.

Good cheap foundations for scrap-books are the old "Pub. Doc's," so many of which are sent out to men who care nothing about them. By removing every other leaf, room is made for the scraps; or two leaves out of the three, if the scraps are pasted on both sides of the remaining leaf. The first way is best, as the other overloads the leaves and causes them to be easily torn out. Have a book for each of the main departments of farming; and assort the articles carefully by topics, in such a way that by the aid of a good index (the progress of which must go along with the progress of each book) any one can be easily turned to. Great differences and much disagreement will appear in the views of different writers, which are sure to be confusing at first. But, as the collection increases, a sort of order will begin to appear in the seeming chaos, and the sense of superior writers will begin to prevail. Meantime, it is no drawback to have all shades of opinion and belief before the eyes; because the great and essential point in the study of so broad a subject as agriculture is, and always must be, to recognize its breadth and multiform diversity—so great that even for adjoining farms very different systems may possibly be necessary to realize the best results. Still, there are fundamental principles underlying all conditions, and these, too, will become more and more apparent with the progress of the work. What appears extremely confusing at first will gradually clear itself to the mind of the patient student, and especially to him who notes carefully the practical workings of different methods that come under his personal notice. This many-sidedness of our business, vexatious as it may seem in the beginning, becomes in the course of time the thing that of all others gives it an enduring and constantly-increasing interest.

The student of agriculture should keep an open mind, and beware of contracting prejudices quickly where he should rather be forming opinions slowly. Perhaps the greatest single drag upon agriculture to-day is the many unfounded prejudices of those who are trying to live by it. These stand in the way of progress by preventing any trial of new things or new ways, among which are always some good things and good ways, that are worth the labor and cost of winnowing them out. With time and study a farmer indeed acquires the faculty of judging the value of any novelty with considerable exactness; but this is a vastly different thing from the general and stupid prejudice against "all these new-fangled notions."

Editorial Notings.

IT is not always the printer that is to blame, though we writers are fond of making him our scape-goat. In our last Editorial Notings we spoke of saltpeter as destroying the solubility of meat in the fluids of the mouth. If to "mouth" are added "and stomach," the reader will have it as we meant to give it. "Digestive fluids" would have been still more accurate.

IT would be interesting to be informed how our esteemed contemporary, the *Homestead*, found out what it claims to "know," in the extract we print in this column, headed "Vermont Cow-Feeding." Its editor there says: "We *know* that the generality of agricultural papers are not thus anxious to accommodate their readers,"—*i. e.*, in answering questions on farm subjects. "It is better," dear brother, "not to know so much, than to know so much that ain't so." It stands to reason that we all desire to oblige our readers in thus helping them to facts. That is what we are here for.

VICK'S MONTHLY MAGAZINE.—For now eleven years the liberal publisher of this interesting periodical has not failed to make us an acceptable New Year's present in the handsome and uniformly bound volumes of each succeeding year. Ranged together, they ornament our book-shelves; but much more than this, they form so complete a compendium of horticultural information that we find ourself referring to them, on many occasions, as a sort of cyclopedia of gardening. And not only is it a handsome book outside; its many accurate and beautiful colored prints of flowers and flowering plants, new and old, give it much favor with visitors, who make a great resource of its pages when waiting the leisure of their often very busy possessor. We may add that the subscription price of Vick's Monthly is $1.25, and that many valuable premiums are offered for clubs, large and small, by the publisher, James Vick, seedsman, Rochester, N. Y.

Vermont Cow-Feeding.

I have never troubled you with any questions, but think I have learned something from the questions of others and the answers given to them in the *Homestead*. I wish now to ask about a subject which is of as much, if not more, importance than any other which interests New England farmers—about rations for the stock during our long winters. I am of the opinion that a ration for growing stock should be compounded somewhat differently than one for dairy purposes. I am feeding my cows that give milk all the good clover and timothy hay they will eat; it is about one-fourth alsike clover and three-fourths timothy. I have never weighed out the hay, as I think a cow's appetite the surest test as to the amount needed, though many estimate the amount at twenty pounds per day. In addition to this they have a grain ration, as follows: One pound old-process linseed meal, costing $1.45 per one hundred pounds; two pounds corn-meal, costing $1.12½ per one hundred pounds; four pounds wheat bran, costing ninety-two and one-half cents per one hundred pounds. The hay is worth from forty-five to fifty cents per one hundred pounds. How shall I change this to make a well-balanced ration and at the same time, if possible, diminish the cost for the real value received?—*C., Hinesburgh, Vt.*

In the first place, let us repeat again that it is no trouble to answer the questions of our subscribers. There is lots of work in it, but that's what the *Homestead* is for—to benefit its subscribers; and how better than by giving them the information they want? Many a subscriber is perhaps doing some part of his farm business at a loss, when by asking for more light he might be able to do it at a profit. We know that the generality of agricultural papers are not thus anxious to accommodate their readers, but it is the *Homestead's* policy every time, and if our readers don't improve their opportunities it isn't because we have failed to make known our willingness to help them. In answer to your question, Professor Cooke of the Vermont Experiment Station writes: "You give a full quantity of grain for the average cow weighing 1,000 pounds, but it is not well balanced. If the grain feed is of average good quality, it contains one part of muscle-forming foods, or albuminoids, to seven and one-half or nearly eight parts of the so-called 'fat-formers,' or sugar, starch, etc. This is much too wide a ratio. I would recommend giving one pound of cotton-seed meal, one pound of corn-meal, one pound of gluten meal and three pounds of bran. This makes a ratio of about one-sixth—that is, one part of albuminoids to six of the sugar, starch, etc. This ration will cost a little less than the one given above, but contains a slightly larger amount of digestible matter, and in a much better balanced proportion. Unless his cows are large, they probably do not eat twenty pounds of hay per day. Our Jerseys and Ayrshires at the Experiment Station seldom eat more than seventeen or eighteen pounds."—*Homestead.*

FEED your horse three times daily, but never overfeed.